DOCUMENT RESUME

ED 372 029 SP 035 263

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TITLE Comparative Didactic: A New Research Perspective.
PUB DATE 28 Feb 94
NOTE 9p.
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Educational Theories; *Epistemology; Foreign Countries; Higher Education; High Schools; Instruction; *Intellectual Disciplines; Junior High Schools; Models; Teaching Methods
IDENTIFIERS *Comparative Didactic; *Discipline Based Teaching Theory; *Knowledge Acquisition

ABSTRACT

Comparative didactic views classroom epistemologies in various disciplines from a comparativist perspective. A diagrammatic model is suggested which takes account of problems posed by different disciplines. The model puts forward four origins of school knowledge: scientific knowledge, reference knowledge, referential praxis, and expert knowledge. With this map of the origins of school knowledge, it becomes possible to situate the different subject disciplines to the degree that they lie close to one or other of the different poles. The way in which the forms of school knowledge function within the teaching system is then discussed. Teachers obtain school knowledge by way of school district instructions, syllabus, textbooks, and so on. They put that to work in their class in the form of taught knowledge, and the final recipient is pupil knowledge. School, teacher, and pupil epistemologies pose formidable problems of compatibility. The teaching process is characterized as having contextualizing phases, decontextualizing phases, and recontextualizing phases. In scientific disciplines, teaching in junior high school is primarily arranged around contextualizing, whereas in high school it is mainly organized around decontextualizing. In nonscientific disciplines, methods of organization differ by subject. Comparative didactic is felt to provide a better understanding of the way teaching functions in different disciplines. (JDD)

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COMPARATIVE DIDACTIC: A NEW RESEARCH PERSPECTIVE

by

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Comparative didactic: a new research perspective

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Disciplinary Didactics, or the theory of subject teaching, is a recent creation that has seen a notable expansion in France, pioneered by mathematics-teaching theory. From this angle, didactics can be considered as the study and theorization of teaching-linked phenomena peculiar to any one subject matter. It has led us to envisage the existence of teaching theories specific to each discipline, and to rule out the idea that a general theory of didactics is possible.

The theoretical framework built up for mathematics teaching, such as transposition, contract, conceptual field, and situation theory, has been used with varying degrees of success, by didacticians from other disciplines.

Comparative didactic proposes to set up studies which will allow clarification of the problems posed by this "migration" of concepts. It aims more generally to study classroom epistemologies in the various disciplines, viewing them from a comparativist perspective.

So the problematic, for instance, of didactic transposition developed in mathematics-teaching theory, in which scientific knowledge "descends" to the level of a knowledge to be taught, requires a second look from the perspective of comparative didactics. The viewing point has to be reversed, so as to have the knowledge to be taught as the starting-point, and then move upstream towards the body of reference which is their original source. The place of scientific knowledge is thereby relativised, for it becomes necessary to introduce as sources reference knowledge, expert knowledge, and social praxis.

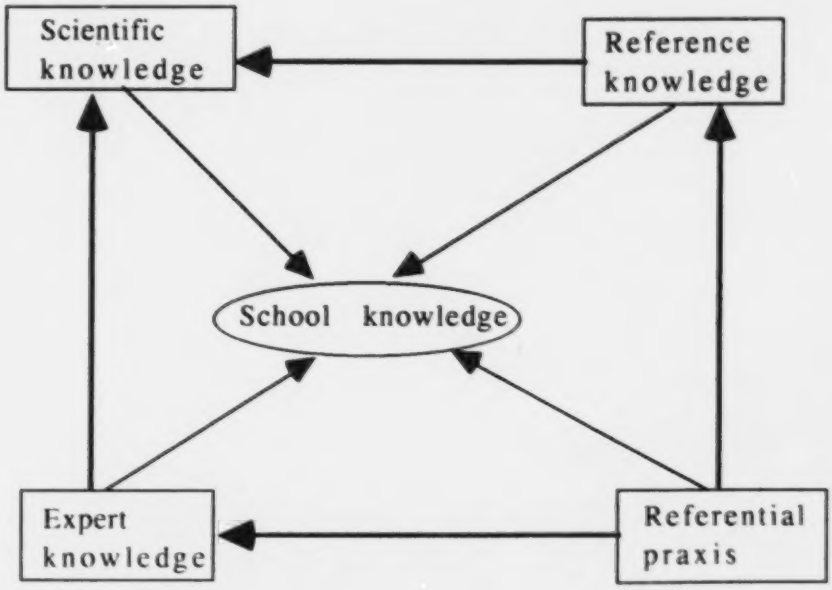
The concept of didactic transposition is thereby enlarged and enables the provision of a reference framework for the various disciplines, and their positioning with regard to each other from the angle of classroom epistemology.

A similar approach by way of other concepts from didactics could also be achieved, and new tools specific to that approach developed. For example, we have introduced (Colomb, 1987) the concept of a "subject discipline contract", to denote "the sum of teacher behaviour that the pupil has a right to expect, and the sum of pupil behaviour that a teacher

should expect in a given discipline and school year". Analysis of the various contracts has enabled us to reveal the elements that form a school culture (Forquin 1992) at particular teaching levels, and study their evolution.

The origins of school knowledge.

The diagramatic model proposed by Chevallard in 1985 is highly suited to mathematics, in which one can in most cases easily find examples of scientific knowledge leading to school knowledge. The model also functions well with the experimental sciences, but once one leaves the ground of those disciplines, it is no longer an adequate guide to reality. Researchers working in the didactics of language, history and geography, do not recognize themselves in the model, because of the fact that within their disciplines they are unable to discern the existence of such kinds of scientific knowledge. In an attempt to tackle the problem, I am therefore going to suggest another diagramatic model, which will still include the previous one, but should to my mind take rather better account of the problems posed by the different disciplines in a comparative perspective.



In this new model I have put forward four kinds of origin for school knowledge. First, scientific knowledge, which forms, according to Chevallard's theory, the original source of school knowledge in

Mathematics, and can serve as a reference for other disciplines. Yet another source useful for most disciplines other than Mathematics is Martinand (1986), who has introduced the concept of **"referential social practices"**. This development is fruitful in that it opens up numerous new perspectives. For, if one looks closely at subject disciplines, one sees that many forms of school knowedge are derived from referential praxis.

Thus, French as a school subject defines much of its school knowledge in terms of practices which are ones of the French language itself, for instance reading and writing skills. But some forms of school learning in French are also defined in terms of **knowledge about practices**, as is the case with grammar, for example. Here we have an example of a third origin for school knowledge, that is **reference knowledge**. In the previous example, these forms of knowledge are extensively developed and correspond to different linguistic theories. These referential forms of knowledge have of course close links with scientific knowledge, as they are on the same level.

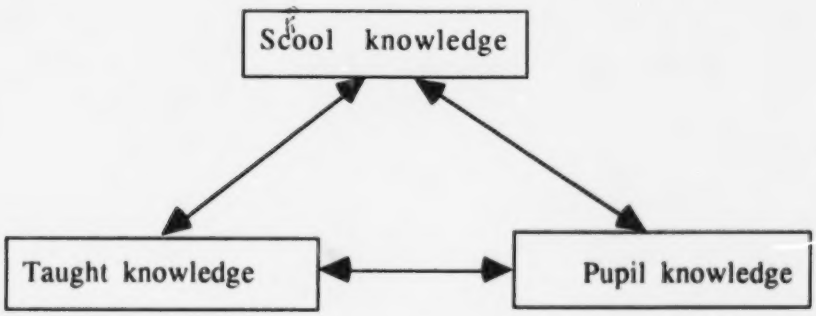
Then comes a fourth body of reference, made up of what I have termed **"expert knowledge"**. In fact it involves **knowledge of referential practices**, no longer knowledge **about** practices. This source is of particular importance in subjects like Physical Education and Sport, in which expert knowledge develops out of practices; and is the origin for school knowledge. This is the case for instance with knowledge developed in top-level sport. Such expert knowledge percolates down into schools, and there is substantial transposition. In technological disciplines as well, numerous forms of expertise developed by professionals lie behind the knowledge in school. The foregoing then is our way of mapping out the landscape of school knowledge and its origins. But something in the landscape is missing. Certain forms of school knowledge exist for which no origin or source reference can be found. At one moment or another, School creates forms of knowledge that can continue existing for some time and are pure creations of School itself. If I can return to the example of French that I have just used, school knowledge subjects like essay writing and commenting a text belong clearly to this type.

With this map of the origins of school knowledge, it becomes possible to situate the different subject disciplines to the degree that they lie close to one or other of the different poles, and that enables us

to throw into relief one of their fundamental epistemological characteristics.

Putting School knowledge to work.

As a second stage it would be useful to raise the issue of the way in which the forms of school knowledge function within the teaching system. For they are functioning in a system under severe duress, and built upon knowledge in taught form, that is to say, school knowledge transmuted and staged by teachers.



Teachers obtain somewhere an awareness of **school knowledge** by way of Ministerial instructions, syllabus, textbooks and so on. Their job is to put all that to work in their class, in the form of **taught knowledge**. The final recipient of the whole process is of course the pupil, hence **pupil knowledge**. So we find ourselves faced with three very different types of knowledge, functioning according to equally different modes. One could define the goal of teaching as one aiming at a maximum minimisation of the distance between these three objects referring to school knowledge. And it is really vital to bring out the fact that the three systems of assessing these knowledge forms, that is school, teacher and pupil epistemologies, are three systems functioning along radically different lines and set-ups, and so they pose formidable problems of compatibility. One can explain a certain number of misunderstandings, difficulties and failures, precisely by the existence of a marked "divorce" between these three assessment systems, notably between teacher and pupil epistemology.

We have attempted to approach this issue (Colomb, 1993) by pluridisciplinary research on the progression of pupils in France from the Troisième (the equivalent of ninth grade) at age 15 to the Seconde at

16, (equivalent to tenth grade), which involves considerable structural school change, that from Collège to Lycée, (roughly equivalent to middle school & upper school).

Our analysis is based on a common typology characterizing the phases of the teaching process :

- **contextualizing phases** in which the knowledge (or skills) to be taught is placed in a context in which the pupils are induced to make sense of it, and build up knowledge relating to the goal.
- **decontextualizing phases** in which the teacher induces the pupils to depersonalize the knowledge and thereby institutionalizes the knowledge.
- **recontextualizing phases** in which the teacher induces the pupils to "stretch" the meaning of the knowledge built up by extending it into new situations different from those in which it was built up.

In scientific and instrumental disciplines, teaching in the Troisième is for the most part arranged around contextualizing ; whereas in Seconde it is mainly organized around decontextualizing. One should note that in both cases the process is rarely total and absolute, and the arrangement of these phases differs perceptibly depending on the sequences observed.

In non-scientific disciplines the methods of organization differ perceptibly from one subject to another.

So, for instance :

• In Biology, the teaching dynamic produces a marked contextualizing phase, followed by a brief induction one, and ends up with a slight decontextualizing phase. In Seconde, a first, swift context-establishing phase is followed by one of equally rapid removal from context, with a final recontextualizing phase after a brief induction one. Generally the course is arranged in "loops" of tautological character : that is, the idea expounded at the start and treated as an hypothesis, is the same as the one that will later be drawn from the study of the documents and adopted as the conclusion, and so it is a fake discovery.

• In Chemistry, Troisième is busy "doing things", concrete activities that lay the ground for conceptualizing by induction. The conceptualizing, however, is done by the teacher, and there is little reconceptualizing activity. In Seconde, the concepts are usually introduced by the teacher without any preparatory phase, and then the pupils just have to recognize and apply the concept in new situations.

• In Physical Education and Sport, the rule of course is that teaching is rooted in "doing". In Troisième, however, the starting point is generalized physical activity without any prescribed achievement goals for pupils, whereas, in the Second, pupils are often given "mini-chunks" of activity isolated from the rest, which leads to a loss of direction. In both cases the absence of any recontextualizing phase means that the teaching goal (object) is never fully formed.

• In History and Geography, one sees a notable increase in "encyclopaedism", a speeding up of the rhythm and quantity of data delivered, and a reinforcement of disciplinary exercises. The "teaching-loop" phenomenon, which involves moving off from a generalization that introduces the object under study and idea under which future statements will be pigeon-holed, following up with illustration, development, breaking it down..., finally coming back to that first generalization, is characteristic of both levels. The "lecture cum student dialogue" is the dominant model in both Troisième and Seconde grades

• In Modern Languages, there is marked concern for contextualizing in Troisième, where the teaching corpus is approached in a closed situation. In Seconde, owing to the variety of content treated, contextualizing becomes pointless, and recontextualizing is rare and sketchy.

• In Mathematics, we have managed to develop two models for the way teaching functions, differing considerably from Troisième to Seconde. The contextualizing phases are fairly substantial in Troisième, but tend to vanish and be replaced by decontextualizing phases in Seconde, where there is a particularly extensive recontextualizing phase too.

On this analytical base relating to the three poles of school knowledge and their putting into practice, individual disciplines can find how their position relates to that of the others. And so the display of how loop-type teaching models characterize biology, history and geography teaching, redounds to the huge complexity and considerable variability of the knowledge at work in those disciplines.

A common characteristic markedly displayed in the various analyses, whatever the discipline or level, is the difficulty teachers experience in dealing with the linkage between the contextualizing and decontextualizing phases. The latter are moreover very brief, and entirely the responsibility of the teacher, which raises serious

questions about any so-called practice of constructivist-style teaching. It goes to reveal a major problem of teaching direction here.

We may hope that these few examples, amongst many, have shown the kind of problems Comparative Didactic can study, and the usefulness of such study for a better understanding of the way teaching functions in the different disciplines with which a pupil is confronted in the course of his school career.

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